

CLAIMS

1. Transparent substrate carrying a coating stack comprising at least one metallic coating layer comprising silver or a silver alloy, each metallic coating layer being in contact with two non-absorbent transparent dielectric coating layers, the coated substrate being adapted to withstand a bending or tempering type of heat treatment, characterized in that prior to such heat treatment, each of the dielectric coating layers comprises a sub-layer based on a partially oxidized combination of two metals.
2. Transparent substrate carrying a coating stack in accordance with claim 2, characterized in that the said combination of two metals is based on Ni and Cr.
3. Transparent substrate carrying a coating stack in accordance with claim 1 or claim 2, characterized in that at least one metallic coating layer of the said coating stack is in contact with at least an underlying sub-layer of an oxide of a metal selected from Ti, Ta, Nb and Sn.
4. Transparent substrate carrying a coating stack in accordance with any one of claims 1 to 3, characterized in that at least the sub-layer based on a partially oxidized combination of two metals which is closest to the substrate is in contact with an underlying sub-layer of an oxide of titanium.
5. Transparent substrate carrying a coating stack in accordance with any one of claims 1 to 4, characterized in that the dielectric coating layer positioned between the substrate and the first metallic coating layer comprises sub-layers of metal oxides or of oxides of combinations of metals.
6. Transparent substrate carrying a coating stack in accordance with any one of claims 1 to 5, characterized in that at least one dielectric coating layer comprises a sub-layer based on a nitride.
7. Transparent substrate carrying a coating stack in accordance with claim 6, characterized in that the said nitride is a nitride of Si, Al, or a combination of these elements.
8. Transparent substrate carrying a coating stack in accordance with any one of claims 1 to 7, characterized in that each metallic coating layer comprises a combination of silver and platinum or palladium.

9. Transparent substrate carrying a coating stack in accordance with any one of claims 1 to 8, characterized in that the coating stack contains a single metallic coating layer.

10. Transparent substrate carrying a coating stack in accordance with claim 9, characterized in that the optical thickness of the dielectric coating layer closest to the substrate is between 50 and 90 nm, that of the other dielectric coating layer is between 70 and 110 nm, that of the sub-layers based on a combination of two metals is between 3 and 24 nm and the geometrical thickness of the metallic coating layer is between 8 and 15 nm.

11. Transparent substrate carrying a coating stack in accordance with claim 10, characterized in that after a tempering or bending type heat treatment the substrate has a haze of less than 0.3% and an emissivity of less than 0.08, preferably of less than 0.05.

12. Transparent substrate carrying a coating stack in accordance with claim 11, characterized in that during a tempering or bending type heat treatment the luminous transmittance of the substrate under Illuminant A varies by less than 10%, its color purity in reflection varies by less than 5% and its dominant wavelength in reflection varies by less than 3 nm.

13. Transparent substrate carrying a coating stack in accordance with any one of claim 1 to 8, characterized in that the coating stack contains two metallic coating layer.

14. Transparent substrate carrying a coating stack in accordance with claim 13, characterized in that the optical thickness of the dielectric coating layer closest to the substrate is between 50 and 80 nm, that of the dielectric coating layer spaced furthest from the substrate is between 40 and 70 nm, that of the intermediate dielectric coating layer is between 130 and 170 nm, that of the sub-layers based on a composition of two metals is between 3 and 24 nm and the geometrical thickness of the metallic coating layers is between 8 and 15 nm.

15. Transparent substrate carrying a coating stack in accordance with claim 14, characterized in that after a tempering or bending type of heat treatment the substrate has a haze of less than 0.5% and a TLA greater than 76%.

17. Laminated glazing characterized in that it comprises a coated substrate in accordance with any one of claims 1 to 15.

19. Vehicle windshield in accordance with claim 18, characterized in that the metallic coating layers are connected to a current source.

21. Method in accordance with claim 20, characterized in that each metallic coating layer is deposited in an oxidizing atmosphere.

23. Method in accordance with claim 22, characterized in that the said atmosphere comprises 3 to 7% oxygen.

24. Method in accordance with any one of claims 20 to 23, characterized in that at least one sub-layer of each dielectric layer is deposited from cathodes supplied with alternating current.

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